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EXAMINER

SAVAGE, MATTHEW O

ART UNIT

PAPER NUMBER

1723

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/685,394

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Matthew O Savage

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 4,5,21-24,40 and 55 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,6-20,25-39,41-54 and 56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: \_\_\_\_\_

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New claim 55 has been withdrawn from consideration as being directed to a non-elected species not shown in any of the drawing Figures.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 9, 10, 12-20, 31-34, 37-39, 44, 45, 47-49, 53, and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al '901 and Ogata et al '745 .

With respect to claims 1 and 56, Szczepanski et al disclose a cylindrical filter (see FIG. 6) including at least two layers of a prefiltration layer 70 and a precision layer 69 disposed in the direction of filtration, each layer being formed with a non-woven fabric with the fibers being bonded to each other at their contact points (see lines 63-68 of col. 4), the diameter of the fibers in the precision layer being smaller than the diameter of the fibers the prefiltration layer. Szczepanski et al fail to specify the fibers of the prefiltration layer as becoming gradually smaller in the direction of filtration. Pall et al discloses the concept of providing a prefiltration layer disposed upstream of a precision filtration layer with the prefiltration layer having fibers that become gradually smaller in the direction of filtration (see example 11, columns 19-20) and suggests that such an arrangement provides high filtration efficiency. It would have been obvious to have

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modified the filter of Szczepanski et al so as to have included a prefiltration layer arranged as suggested by Pall et al in order to improve the filtration efficiency of the filter. Szczepanski et al and Pall et al fail to specify the fibers as being bonded by heat treatment. Ogata et al disclose the concept of bonding melt blown fibers of a cylindrical filter by heat treatment method, the filter having fibers that decrease in diameter along a radially inward direction of the filter in either a successive/continuous or step wise manner (see lines 3-11 of col. 4), and suggests that such an arrangement prevents clogging by fluid pressure (see lines 6-31 of col. 5). It would have been obvious to have modified the combination of Szczepanski et al and Pall et al so as to have included fibers bonded by a heat treatment method as suggested by Ogata et al in order to prevent clogging of the filter by fluid pressure.

With respect to claim 38, Szczepanski et al disclose a cylindrical filter (see FIG. 6) including at least three layers of a prefiltration layer 70 and a precision layer 69, and a support layer 68 disposed in the direction of filtration, each layer being formed with a non-woven fabric with the fibers being bonded to each other at their contact points (see lines 63-68 of col. 4), the diameter of the fibers in the precision layer being smaller than the diameter of the fibers the prefiltration layer, and the fibers in the support layer being larger than the fibers in the precision filtration layer and being bonded together (see lines 63-68 of col. 4). Szczepanski et al fail to specify the fibers of the prefiltration layer as becoming gradually smaller in the direction of filtration. Pall et al discloses the concept of providing a prefiltration layer disposed upstream of a precision filtration layer with the prefiltration layer having fibers that become gradually smaller in the direction of

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filtration (see example 11, columns 19-20) and suggests that such an arrangement provides high filtration efficiency. It would have been obvious to have modified the filter of Szczepanski et al so as to have included a prefiltration layer arranged as suggested by Pall et al in order to improve the filtration efficiency of the filter. Ogata et al disclose the concept of bonding melt blown fibers of a cylindrical filter by heat treatment method, the filter having fibers that decrease in diameter along a radially inward direction of the filter in either a successive/continuous or step wise manner (see lines 3-11 of col. 4), and suggests that such an arrangement prevents clogging by fluid pressure (see lines 6-31 of col. 5). It would have been obvious to have modified the combination of Szczepanski et al and Pall et al so as to have included fibers bonded by a heat treatment method as suggested by Ogata et al in order to prevent clogging of the filter by fluid pressure.

As to claims 2, 17, 18, 39, 49, Szczepanski et al disclose a prefiltration and precision layers formed of one of polyolefin and polyester fibers (see lines 7-13 of col. 5).

Concerning claims 3, 19, 20, Szczepanski et al and Ogata et al disclose a prefiltration layer formed by a melt blow process.

Regarding claims 9, 14-16, 31, 32, 44, 48, Szczepanski et al, Pall et al, and Ogata et al fail to specify the recited void ratios, however, such a modification would have been obvious in order to optimize the filter for a particular application.

As to claims 10, 33, 34, 45, Szczepanski et al and Ogata et al disclose a melt blow process for forming fibers of the precision filtration layer.

Concerning claim 12, Szczepanski et al disclose non woven fabrics that are different from one another (see lines 41-40 of col. 8).

Claims 13 and 47 recites a process step of making a filter of which carries no weight in an apparatus claim.

As to claim 37, Szczepanski et al disclose the recited support layer 68.

As to claims 53 and 54, Szczepanski et al disclose filter layers that are bonded together (see lines 63-68 of col. 4). In addition, Ogata et al disclose layers that are bonded together

Claims 6-8, 25-30, and 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al and Ogata et al as applied to claim 1, 12, 13, 38 above, and further in view of Barboza et al.

With respect to claims 6, 25, 26, 41, Szczepanski et al and Pall et al fail to specify the prefiltration layer as being a mixture of fibers having different melting points. Barboza et al discloses the concept of providing filtration layers formed of mixtures of fibers having different melting points inherently including a difference in melting point of 10 degrees C or more (see lines 41-65 of col. 7) and suggests that such an arrangement optimizes the filter for particular end-use applications. It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included fibers as suggested by Barboza et al in order to optimize the filter for a particular end-use application.

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Regarding claims 7, 8, 27-30, 42, 43, Szczepanski et al and Pall et al fail to specify the layers as having fibers of different diameters. Barboza et al disclose a filter having layers formed of fibers with different diameters and suggests that the larger fibers provide structural support for the smaller fibers thereby preventing collapse of the layers (see lines 8-23 of col. 7). It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included layers of fibers of different diameters as suggested by Barboza et al in order to provide filtration layers that were resistant to collapse. Barboza et al fails to specify the fiber diameter ratios recited in claims 7 and 8, however, such modifications would have been obvious in order to provide the degree of support for a particular application.

Claims 11, 35, 36, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Szczepanski et al in view of Pall et al and Ogata et al as applied to claim 1 and 38 above, and further in view of Miller et al.

With respect to claims 11, 35, 36, and 46, Szczepanski et al, Pall et al, and Pall et al fail to specify a precision filter layer formed of glass fibers. Miller et al discloses the concept of providing a precision filter layer formed of glass (see example 1) and suggests that such an arrangement optimizes the filter for a particular filtering application. It would have been obvious to have modified the combination suggested by Szczepanski et al and Pall et al so as to have included a precision filter layer formed of glass fibers as suggested by Miller et al in order to optimize the filter for a particular application.

Claims 50 and 51 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Applicant's arguments filed 10-10-00 have been fully considered but are considered moot in view of the new grounds for rejection.

With respect to the information disclosure statement filed on 10-10-00, foreign patent documents AN and AP have not been considered since a concise explanation as to the relevance of the references has not been given in either the instant or parent application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O Savage whose telephone number is 703-308-3854. The examiner can normally be reached on Monday-Friday, 6:00am-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda W. Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

*M. Savage*

Matthew O Savage  
Primary Examiner  
Art Unit 1723

mos  
April 2, 2003